CITY OF TORRANCE, CALIFORNIA

ADDENDUM NO. 2
Issued: September 23, 2010

TO

PROPOSAL, SPECIFICATIONS, BOND AND AFFIDAVIT FOR THE CONSTRUCTION OF WALTERIA RESERVOIR SLOPE STABILITY PROJECT, C.I.P. No. I-95 B2010-17

Note the following changes and/or additions to the Plans and Specifications for the project indicated above. The bidder shall execute the Certification at the end of this addendum, and shall **attach all pages of this addendum to the Contract Documents submitted with the Bid.** In addition, the bidder shall complete and submit the "Acknowledgment of Addenda Received" Form provided in Section C of the Specifications.

1. **Refer to Specifications SECTION A – NOTICE OF INVITING BIDS and ADDENDUM No. 1 – Item No. 1.**

   The City has again delayed the time to open bids. Consequently, the first paragraph is hereby deleted in its entirety and new language is added as follows:

   "Notice is hereby given that sealed bids for performing the following described work will be received at the Office of the City Clerk of the City of Torrance, California, **2:00 p.m. on Thursday, September 30, 2010,** after which time they will be publicly opened and read at approximately 2:15 p.m. in the Council Chambers of said City:"

2. **Refer to Specifications SECTION B – INSTRUCTIONS TO BIDDERS.**

   Add an additional paragraph to the end of Subsection D.3. – Bid Instructions and Submissions as follows:

   "The City shall award the Contract to the lowest bid regardless of Bid Schedule. The Contractor need only submit one Bid Schedule, i.e., Bid Schedule A, B, or C.

3. **Refer to page C-4 of the Bidder's Proposal document on blue-colored paper included with the Contract Documents.**

   The Item Description for Bid Item #11 is hereby revised to "Furnish and install welded wire reinforcement or geogrid mats". The bidder shall make these corrections as shown below on its blue-colored original Bidder's Proposal to be submitted with your Bid. Should the bidder not correctly make the corrections below, it would not necessarily result in a non-responsive bid.

11	1,554	CY	FURNISH AND INSTALL WELDED WIRE REINFORCEMENT OR GEOGRID MATS		

4. **Refer to Specifications SECTION E, Special Provisions, Page E-5, Sub-Section 2-5.3.3 Supporting Information.**

   The section is amended to read as follows:

   "Replace the second paragraph with the following:

   Submittals are required for the following:

   1) Contractor's experience
   2) Contractor's Key Personnel
   3) Construction Survey
   4) Drilling Method (Schedule A)
   5) Nail Grout Placement Procedures and Equipment (Schedule A)
   6) Shotcrete Materials and Methods (Schedule A)
   7) Soil Nail Testing Methods and Equipment Setup (Schedule A)
   8) Manufacturer Certificate of Compliance for the Soil Nails (Schedule A)
   9) Segmental Retaining Wall System (Schedule B)
   10) Geogrid Reinforcing (Schedule B)
   11) Erosion Control Fabric
   12) Construction and Excavation Plan
   13) Irrigation System Modifications
   14) Landscaping
   15) Welded Wire Mesh (Schedule C)
   16) SWPPP"

5. **Refer to Specifications SECTION E, Special Provisions, Page E-16, Sub-Section 6-1.3, Requirements.**

   Add the following sub-item:

   "8) Construction Phasing per Appendix X."

   Revise the first sentence of the second paragraph to read as follows:

   "Should the Contractor fail to meet Requirements No. 1 through 8, the Engineer reserves the right to prohibit the Contractor from performing further work until the clean up, construction, or rehabilitation of sprinklers is in conformance with the aforementioned requirements."

6. **Refer to Specifications SECTION E, Special Provisions, Page E-20, Sub-Section 7-8.6.1, NPDES General Permit, Notice of Intent (NOI) and Notice of Termination (NOT).**

   Replace the entire sub-section, presented herein as Attachment No. 1.

7. **Refer to Specifications SECTION E, Special Provisions, Page E-24, Sub-Section 7-8.8, Contractor's Storage Yard.**

   Add the following to the end of the first paragraph:

   "The Contractor has the option to use the City's parking lot at the north end of the Las Canchas Tennis Facility, with access off Crenshaw Boulevard, provided the parking lot and access road are slurry sealed and re-striped at the completion of the project. The area to be slurry sealed is approximately 15,100 SF. All costs associated with the slurry sealing and re-striping shall be included in the bid price for mobilization."

8. **Refer to Specifications SECTION E, Special Provisions, Page E-25, Sub-Section 7-10.1, Traffic and Access**.

   Revise the second paragraph to read as follows:

   "The Contractor shall maintain all vehicle and personal access to all existing businesses on the site. Contractor shall limit the work/staging area and stockpiles to only what is required for that particular work day. Parking for the businesses is limited. There shall not be any Contractor parking on-site. The limits of work areas are shown in Appendix X."

9. **Refer to Item No. 8 above**.

   Specifications Appendix X, Work Areas and Construction Phasing Plan, is presented herein as Attachment No. 2.

10. **Refer to PLAN SHEET WP-280, Sheet 10 of 12, Note 1 and ADDENDUM No. 1 – Item No. 5.**

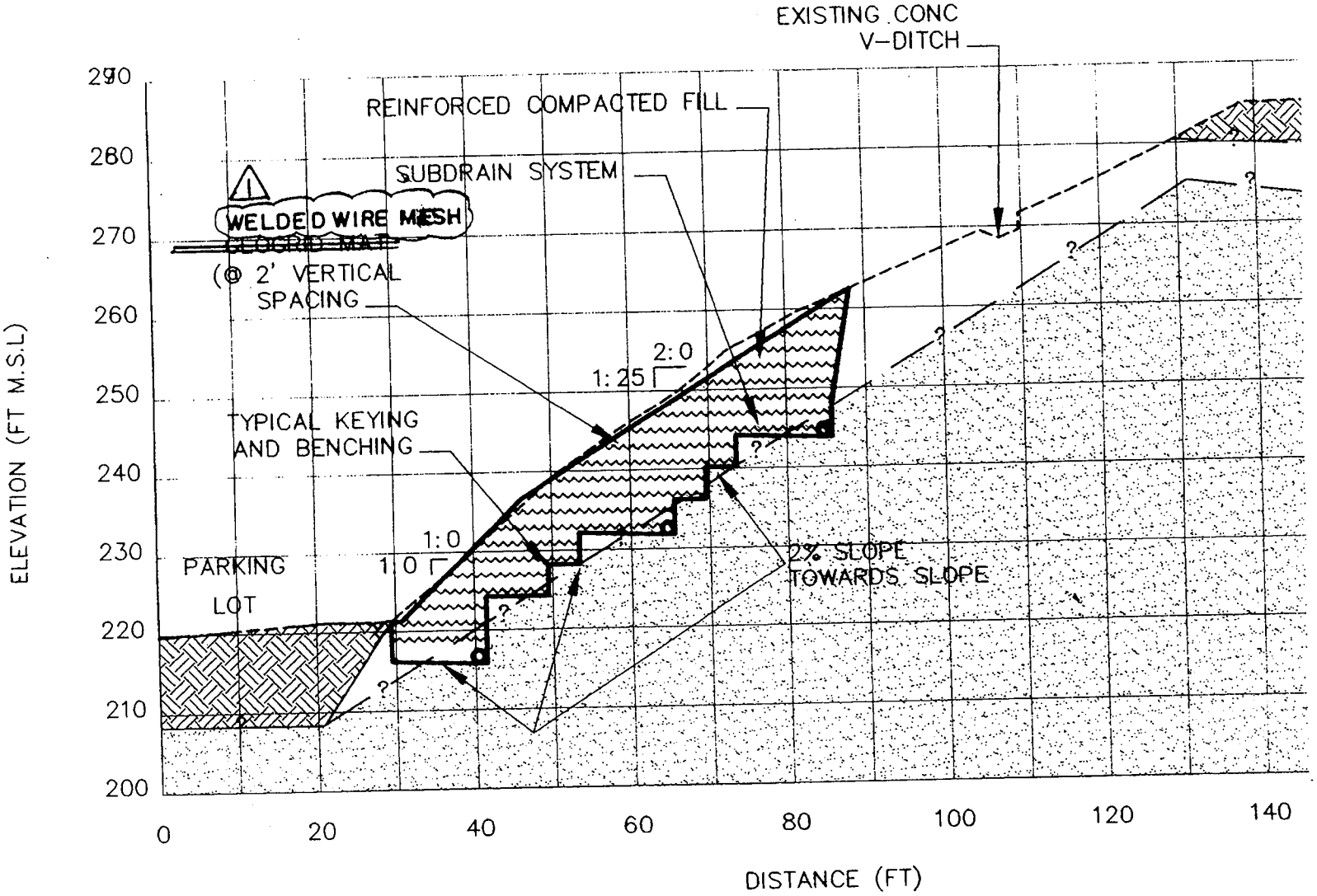
    The Geo-technical Report referenced in the note and provided as Appendix VIII of the Specifications in Addendum No. 1 is hereby revised to include pages 9 – 14, is presented herein as Attachment No. 3.

11. **Refer to PLAN SHEET WP-280, Sheet 12 of 12, Cross-Section B-B'.**

    The reinforced compacted fill cross-section below is hereby revised to change the geogrid mat to welded wire mesh:

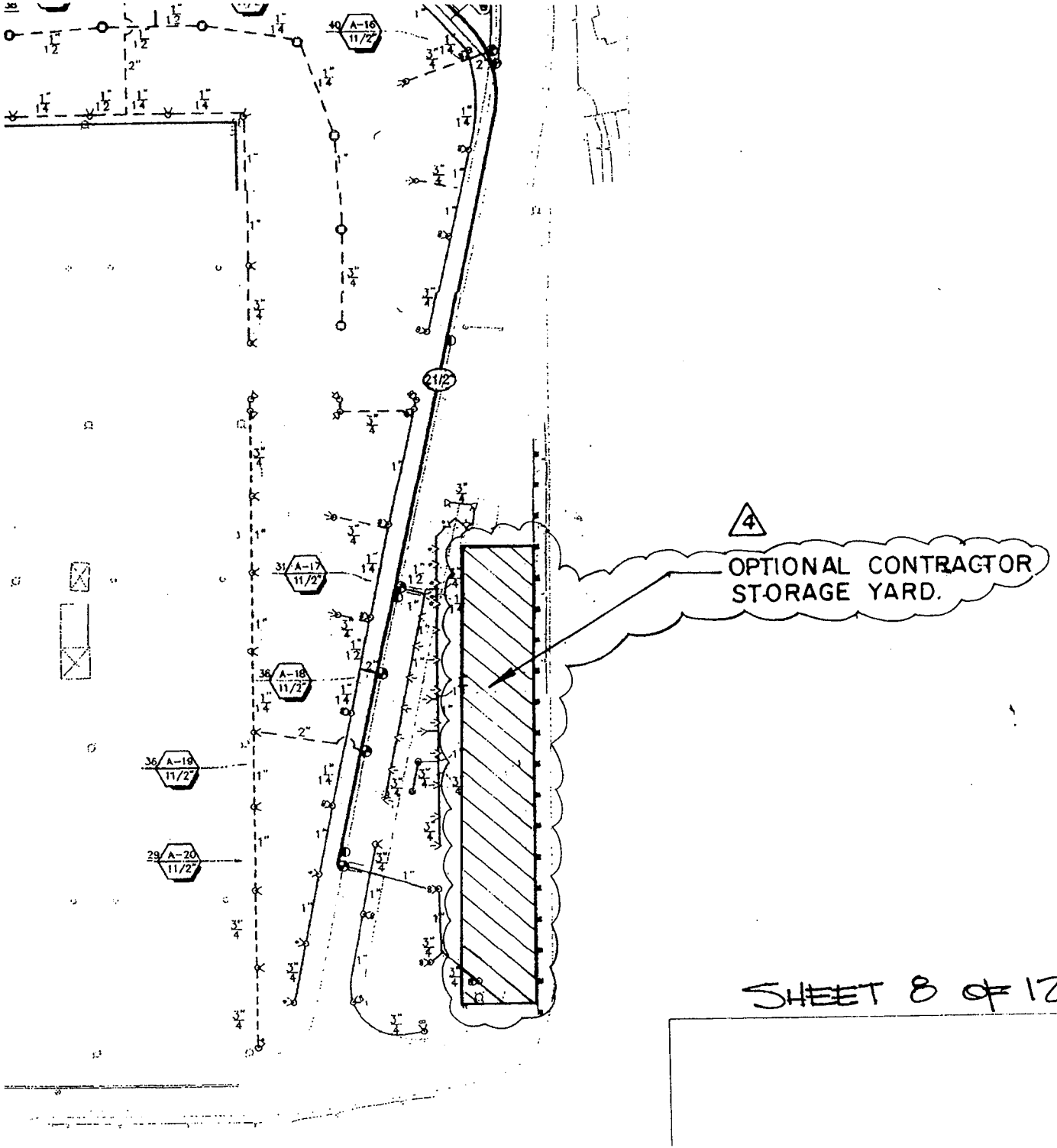
CROSS-SECTION B-B'

B



12.Refer to PLAN SHEET WP-280, Sheet 8 of 12.

The site plan is revised below to show the location of the optional Contractor's storage yard:



SHEET 8 OF 12 SHEETS.

END OF ADDENDUM NO.2

By Order of the Public Works Director

ROBERT J. BESTE
Public Works Director

By: _____
ELIZABETH OVERSTREET. P.E.
Acting City Engineer

ATTACHMENT NO. 1

7-8.6.1 NPDES General Permit, Notice of Intent (NOI) and Notice of Termination (NOT). Construction activities including clearing, grading and excavating that result in land disturbances of equal to or greater than one acre are covered by the National Pollutant Discharge Elimination System General Construction Permit, State Water Board Order No. 2009-0009-DWQ. Dischargers obtaining coverage will file electronically for coverage under Order No. 2009-0009-DWQ. Order No. 2009-0009-DWQ is a Risk Based permitting approach. The Contractor is required to go to the State Water Resources Control Board website and determine risk level and apply for permit and update permit using the Storm Water Multiple Application and Reporting Tracking System (SMARTS). The SMARTS system is an online tool for submitting Notice of Intent (NOI), Notice of Termination (NOT), compliance and monitoring data and Annual Reports when required.

Order No. 2009-0009-DWQ includes, in Attachment A, requirements for all Linear Underground/Overhead Projects (LUPs) that are covered under the Small LUP General Permit 2003-007-DWQ. LUPs will be broken into project segments designated as LUP Type 1, Type 2, and Type 3. These LUP Types are analogous to the risks levels for traditional construction projects.

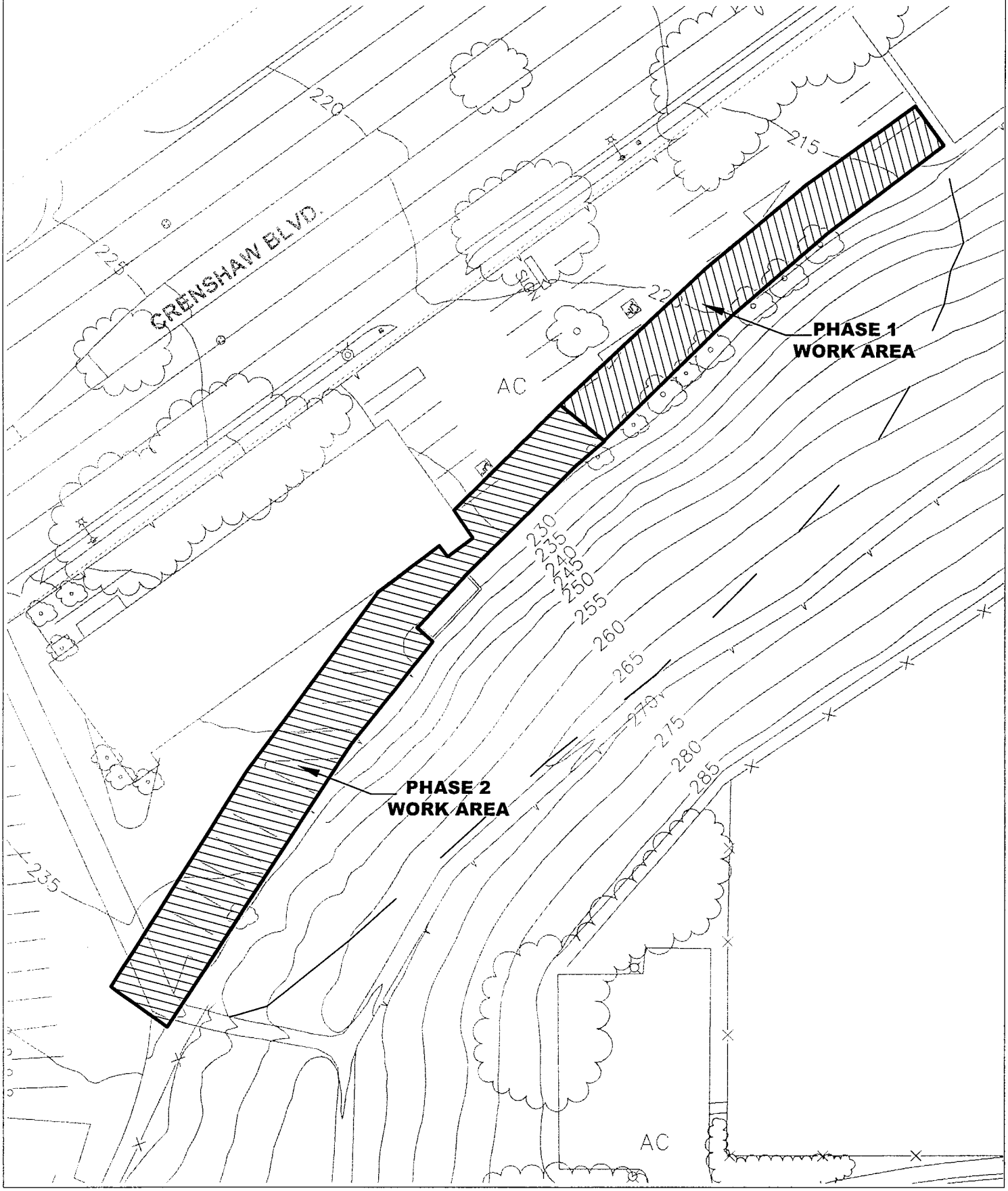
This General Construction Permit regulates pollutants in discharges of storm water associated with construction activity. To obtain authorization for proposed storm water discharges, pursuant to this General Construction Permit, the Contractor must submit sue the SMARTS system to submit NOI and pay the appropriate fee to the State Regional Water Quality Control Board (SWQCB). Contractor shall provide to the City thier a Storm Water Pollution Prevention Plan (SWPPP). The Contractor shall terminate coverage under the General Construction Permit for a complete project by submitting a NOT via the SMARTS system after post construction storm water Best Management Practices (BMPs) are in place and approved by the City.

Full compensation for preparation of the NOI, NOT, required fees, construction, and post construction BMPs, sampling, analysis and reporting as required by Order No. 2009-0009-DWQ and all other related costs shall be considered as included in the bid for NPDES COMPLIANCE.

ATTACHMENT NO. 2

WORK AREAS AND CONSTRUCTION PHASING SITE PLAN

NOT TO SCALE



ATTACHMENT NO. 3

- *Aesthetics and the ability to "blend in" with neighboring (undamaged) slopes;*
- *Ability to meet all required minimum factors of safety for static and seismic slope stability; and*
- *Retention of surficial soils to prevent unwanted sediment runoff.*

8.2 LANDSLIDE HAZARD ZONE

The site is mapped as being in an *Earthquake-Induced Landslide Hazard Zone (Torrance Quadrangle).* Based on the current state of the project site, the potential for landsliding is considered high.

8.3 SLOPE STABILITY ANALYSES

Three (3) stability evaluations were performed for the slope where the construction is proposed. Computations were performed using a program called STEDwin (STABL6®) that essentially calculates the factors of safety against the instability of a slope by a method of slices, employing an adaptation of the Modified Bishop Method. For each postulated failure surface presented in the report, the program generated the lowest factor of safety for the slope with the potential sliding plane. The design minimum factors of safety under static and pseudo-static loading conditions are 1.5 and 1.1, respectively, in accordance with accepted geotechnical practices and agency guidelines. Horizontal and vertical acceleration coefficients of 0.15g were used for a pseudo-static evaluation of the slope. The slope stability analyses utilized the shear strength values shown in the Direct Shear section of this report.

Stability evaluations were performed on the estimated slope configuration taking into account the seepage water encountered by LCI. The results of our global stability evaluations indicate that factors of safety for static and pseudo-static stability are adequate for the proposed construction of the selected stabilization method as depicted in Figures 6 through 13. A summary of the global stability analyses is presented in Appendix C.

8.4 SLOPE STABILIZATION METHODS

8.4.1 Block Walls with Reinforced Compacted Fill

GEI's engineers believe the best solution for repairing and restoring the slope includes a pair of tiered segmental retaining walls. Figure 3 illustrates what we think may be the optimal repair scheme. Segmental wall systems are recommended for their favorable flexibility and drainage characteristics, as well as ease of construction on the steep slope. The slope or bench between and above tiered walls can be landscaped. Popular manufacturers include Keystone Retaining Wall Systems and Foresight Products, LLC brands (drawings are attached in Appendix D), both of which offer many hybrid block wall systems. Design details and sample specifications may be easily downloaded from manufacturer websites (www.keystonewalls.com) and imported directly into project civil engineering drawings.

Wall overturning and sliding would be prevented by layers of geogrid (e.g., Miragrid 3XT or higher) set in compacted fill. The layers of geogrid would be pinned into successive courses of segmental blocks. An actual design may involve further consultation between the Civil Engineer, GEI, and an experienced contractor familiar with segmental retaining walls.

Preliminary wall designs may be based on equivalent fluid pressures equal to 34 psf per foot of total height. Use of this value presumes use of a soil backfill material with internal friction $\varphi \geq 35$ degrees. Wall backfills should be well drained to relieve possible hydrostatic pressure or should be designed to withstand such pressures. Walls subject to surcharge loads should be designed for an additional uniform lateral pressure equal to ½ the anticipated surcharge pressure. For seismic design of walls that can yield at least ¼-inch laterally in 10 feet of wall height, the magnitude of active pressures should be increased by 50 percent.

It is recommended that compacted backfill soils should consist of granular, free-draining soil types with low or negligible expansion potential. Decomposed granite or similar import materials should be adequate for use in the soil backfill zones behind segmental walls. Alternatively, densified crushed rock could be considered. A gravel drainage layer immediately behind the wall elements is customarily specified by the wall manufacturer, even where the bulk of the backfill consists of soil.

8.4.2 Gabion Walls and Compacted Fill

A conventional compacted fill slope matching the 1:1 inclination of the old slope is not considered feasible. GEI recommends another alternative that we think may be the optimal repair scheme. The schematic illustrates gabion walls with ordinary compacted soil backfill (Figure 4). Gabions may consist of 3-foot by 3-foot and 3-foot by 6-foot ArtWeld baskets manufactured by the Hilfiker Retaining Wall Company (Appendix E). In our experience, Hilfiker wire mesh and gabion products provide exceptional performance, even in adverse site conditions. The vertical gravity walls would be founded on competent material and/or bedrock. Gabions have significant advantages in flexibility and free-drainage, and are easily tailored in size, shape, or angle to meet whatever conditions are actually encountered during construction.

For the model repair, calculated minimum factors of safety are at least 1.5 and 1.1 for the static and seismic cases, respectively. Compacted fill soils must meet minimum strength criteria as detailed below. Granular, or onsite fill soils, or import materials should be adequate for use behind gabions or in a hypothetical reinforced fill slope. Supplemental design criteria including but not limited to wire gauge and/or geogrid strength, acceptable soil gradation, and revised minimum relative compaction should be supplied by GEI in the event a smooth inclined reinforced slope is desired.

Hilfiker ArtWeld gabions are designed to accept clean angular stone backfill ranging from 3½ to 12 inches in diameter. In our experience, appearance and placement work best with 4-inch to 8-inch-diameter rock. Angular stones are placed in lifts and arranged to minimize voids. The schematic depicts two (2) walls made of gabions courses. Each wall consists of five (5) gabion courses. The actual number of courses could easily change by one (1) (up or down), depending upon foundation elevations established at the time of excavation. Geotextile fabric will line the back of the baskets to separate the roadway soil fill from the rock fill. We recommend relatively high strength woven materials (e.g., Mirafi Filterweave 300 or higher) to help withstand compaction pressure on the fabric.

8.4.3 Reinforced Compacted Fill

GEI presents an additional alternative that we think may be an optimal repair scheme. The schematic illustrates a wire-reinforced slope constructed with reinforcing mats manufactured by the Hilfiker Retaining Wall Company (www.hilfiker.com) (Figure 5). The mats are factory pre-bent to a desirable 1:1 inclination

at the slope face. Soil retention is achieved with finer wire mesh and erosion control matting (pre-seeded, if desired). In our experience, Hilfiker wire mesh products as shown in Appendix F provide exceptional performance even in adverse site conditions. Successful installation of these products depends on identifying experienced contractors.

The wire mats are embedded in compacted engineered fill keyed and benched into competent material. Keying and benching must be sufficient to strip at least five (5) feet of the native soils exposed by the slide. Calculated minimum factors of safety are at least 1.5 and 1.1 for the static and seismic cases, respectively. Compacted fill soils must meet minimum strength criteria as detailed below. Onsite soils, or similar import materials, should be adequate for use in the reinforced fill slope.

8.4.4 Shotcrete Wall and Soil Nailing

GEI's engineers believe that the implementation of this method for repairing and restoring the slope is feasible, however is cost prohibitive. If the City of Torrance has the sufficient funds for repairing and restoring the slope, the soil nailing wall stabilization technique is a good alternative to be implemented and constructed at the site. Soil nailing is a construction technique for reinforcing the existing ground by installing closely spaced structural inclusions, known as nails. The term "passive" means that the nails are not pre-tensioned when they are installed, as with tiebacks. The nails consist of metal bars or tubes, installed in the excavation cut by placing and grouting in a pre-drilled hole. The system is typically installed during excavation from the top down in relatively short, successive lifts, typically six (6) feet or less.

LCI used the computer program SNAILZ developed by the State of California, Department of Transportation (Caltrans) for design of the soil nailing. Based on LCI's analyses, details for designing the shotcrete wall and soil nailing are provided below; the final design is presented in set of plans shown in Appendix G.

- ***Installation****: Placing and grouting in a pre-drilled hole at an approximate 15-degree inclination (downward)*
- ***Hole Diameter****: Six (6) inches*
- ***Soil Nail****: No. 8 reinforcement bar (rebar) or approved equivalent, with a yield strength of 36 kips per square inch (ksi)*
- ***Facing Punching Shear Capacity****: Six (6) kips (1 kip = 1000 pounds)*
- ***Spacing****: Six (6) feet horizontal and five (5) feet vertical, with the first layer located approximately five (5) feet from top of the wall*
- ***Length of soil nails****: 20 feet for a wall height of 20 feet*

8.5 CONTROL OF SURFACE DRAINAGE

Water is the primary factor affecting slope stability. The increase in unit weight and loss in strength experienced by the colluvium and the weathered bedrock resulting from water saturation makes these materials particularly susceptible to landsliding. Therefore, addressing remedial measures to control surface water is of great concern for this project.

8.5.1 Surface Drainage

Because of the presence of expansive soil, the slope should remain adequately drained toward the parking lot, or to an existing drainage system. Inlet structures should be maintained to ensure their proper function. Water should be transported off the site in approved drainage devices or unobstructed swales.

The impact of heavy irrigation or inadequate runoff gradient can create perched water conditions. This may result in seepage or saturated slope face conditions. Maintaining adequate surface drainage and controlled irrigation will significantly reduce the potential for nuisance-type moisture problems. Following construction of the selected stabilization method, exposed areas of the slope should be landscaped with deep rooted, drought resistant vegetation. Care should be used with future slope irrigation to properly maintain the vegetation but not over water the slope.

8.6 SITE EARTHWORK

The general guidelines presented below should be included in the project specifications to provide a basis for quality control during construction. It is recommended that all structural soil fill be placed and compacted under continuous engineering observation and in accordance with the following:

- *Debris (if any) should be cleared from areas to receive compacted engineered fill. Vegetation and oversized material should be picked from future fill soils during excavation.*
- *Temporary vertical backcuts of at least five (5) feet of height may be made in the colluvium near the slope toe. Taller backcuts should be sloped, shored, or braced. The existing slope should be adequate as a temporary "backcut" for the expected duration of this project.*
- *Stripping of remnant old fill and unsuitable native soils should be performed for support of the reinforced slope. The slope keyway should be at least eight (8) feet wide, with a toe embedment of at least two (2) feet into competent material and/or bedrock. The heel should be canted roughly six (6) inches lower and supplied with a heel drain. Final determinations of stripping and key depths should be made during grading based on the observations and acceptance of the Soils Engineer and/or Engineering Geologist prior to the placement of fill.*
- *Subdrains are recommended in the heel of the foundation keyway, at approximately mid-slope height as shown in Figure 5. Backdrains are recommended for block and gabion walls as shown in Figures 3 and 4. Subdrains and backdrains may consist of "burrito-type" perforated polyvinyl chloride (PVC) pipe meeting requirements for SDR-35 grade, surrounded by at least three (3) cubic feet of ½-inch to ¾-inch (max) gravel per linear foot and encapsulated in appropriate geotextile filter fabric (Mirafi 160N or an accepted alternative). Pipe should be at least four (4) inches in diameter. Solid pipe should be used outside of the keyway and between the mid-slope drains and slope face.*
- *It is expected that both onsite soils and import materials will be needed for the suggested repair. The onsite soils would generally be considered suitable for reuse in the repair. Any import source must have the materials approved and verified by laboratory direct shear testing before transportation to the site.*
- *Fill soils should be placed a few percentages (usually 2.0 to 4.0) above the optimum water content for compaction, in lifts having thicknesses commensurate with the type of compaction equipment*

used, but no greater than approximately 6.0 to 8.0 inches. Small compaction equipment will be needed at the project site.

- *Rocks larger than 6.0 inches in diameter should be excluded from engineered structural fills at the project site.*
- *Continuous engineering observation and field-testing shall be performed to verify that the desired compaction and water contents are being achieved. Where compaction less than the specified minimum is indicated, additional compaction effort (with adjustment of soil water content as necessary) must be performed and adequate density verified before placement of additional fill.*
- *Wall backfill should be placed in complete horizontal lifts.*
- *Soil backfill should be compacted to a minimum relative compaction of 90 percent of the laboratory maximum dry density determined by ASTM D 1557-00.*
- *Crushed rock backfill (if selected) should be moistened and densified in lifts with vibratory equipment. (Large concrete vibrators work especially well for this purpose, and can be used in lifts up to several feet deep.)*

8.7 EXCAVATION CHARACTERISTICS

Due to the marginal stability conditions of the slope, light excavation equipment should be used. Based on the information provided by the exploratory soil borings and our experience with similar soil material, it is our opinion that the onsite earth materials can generally be excavated using light excavation equipment. Some difficulty may be experienced during excavations on bedrock material. Contractors should make their own independent evaluation of the excavatability of the onsite materials prior to submitting their bids.

8.8 TEMPORARY STABILITY OF EXCAVATIONS

The temporary cuts are expected to remain stable during construction, provided the height of unsupported vertical cuts does not exceed five (5) feet. At locations where the proposed cuts are greater than five (5) feet, either slot cutting techniques or placement of shoring elements may be considered during construction to provide temporary stability of the cuts and the slopes above.

Workers should be protected from sloughing and raveling of the cut in accordance with the United States Occupational Safety and Health Administration (OSHA) regulations. Temporary excavations should be observed by the Soils Engineer or his representative so that appropriate additional recommendations necessitated by actual field conditions may be provided. Temporary excavations are time sensitive and localized failures are possible.

The onsite soils will be susceptible to erosion. Therefore, the project plans and specifications should contain the design features and construction requirements to reduce the potential for erosion of the onsite soils both during and after construction. Slopes and other exposed ground surfaces should be appropriately planned with a protective ground cover.

It is the Grading Contractor's obligation to take the measures deemed necessary during grading to provide erosion control devices in order to protect slope areas and adjacent properties from storm drainage and flood

hazard originating from this project. It should be the Contractor's responsibility to maintain slopes in their as-graded form until slope and associated drainage devices are in satisfactory compliance with the project plans and specifications.

8.9 Plan Review and Construction Observation

GEI should be retained to review the final construction specifications for conformance with the intent of our recommendations. The review will enable GEI to modify our recommendations should final design conditions deviate from what is presently understood.

Observation during construction should be performed by a GEI representative to verify that recommendations are achieved. It is imperative that the construction and installation of block and gabion walls and layers of geogrid be inspected by a GEI representative to ensure that Contractor complies with our recommendations. Additionally, a GEI representative must ensure that the Contractor is achieving the recommended depths of excavation, construction of block and gabion walls, installation of soil nails, placement of shotcrete, installation of drainage systems, and grading.

9.0 CONSTRUCTION COST ESTIMATES

During the preparation of this report, we contacted a contractor (Lee Construction Company of Simi Valley, California) that specializes in landslide stabilization. The Contractor understood our scheme of dealing with the presence of the instability in the area of the proposed construction well. The Contractor provided two (2) budgets with costs based on our designs utilizing block walls with reinforced compacted fill, and gabion walls and compacted Fill. The estimated costs are in the order of $311,000 and $318,000. Budgets for the other methods are not provided in this report.

10.0 GENERAL INFORMATION

This report presents recommendations for the subject site based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed in this report. However, the possibility of different local soil conditions cannot be discounted. It is the responsibility of the City's representative to bring any deviations or unexpected conditions observed during construction to the attention of the Soils Engineer and/or his representative. In this way, any required supplemental recommendations can be made with a minimum of delay to the project.

Construction should be observed and tested, if necessary, at the following stages by the Soils Engineer and/or his representative.

- *During pre-construction activities;*
- *During excavations and the exposure of the keyway bottom;*
- *During backfilling operations;*

BIDDER'S CERTIFICATION

I acknowledge receipt of the foregoing Addendum No. 2 and accept all conditions contained therein.

_____
Bidder

_____ _____
By Date

******* Submit this executed form with the bid *******

Please fill out and submit the "Acknowledgment of Addenda Received" form provided in Section C of the Specifications.